

through 38, 41, and 42 were allowed. Claim 35 has been cancelled without prejudice. Claims 12, 13, 23, 30, 32 through 34, 36 through 39, 41, and 42 have been amended. Claim 43 has been added.

Claim 23 was rejected under 35 U.S.C. § 103 over U.S. Patent No. 6,010,537 (Konno, et al.) in view of U.S. Patent No. 5,808,808 (Yamanashi). Claim 35 was rejected under 35 U.S.C. § 103 over U.S. Patent No. 6,226,130 (Mukaiya, et al.) in view of U.S. Patent No. 6,016,228 (Uzawa). Claim 39 was rejected under 35 U.S.C. § 103 over Mukaiya, et al. in view of Yamanashi. This rejection is respectfully traversed. Claims 24 through 26, 28 through 34, and 40 were objected to and indicated as being allowable if rewritten in independent form. All objections and rejections are respectfully traversed.

Claim 43, formulated by rewriting objected-to Claim 24 in independent form, has been added; accordingly, allowance thereof is earnestly solicited.

Claim 23 recites, inter alia, that the second lens unit moves to the image side for zooming from the wide-angle end to the telephoto end. However, Applicant respectfully submits that neither Konno, et al. nor Yamanashi, even in combination, assuming, arguendo, that the documents could be combined, discloses or suggests at least the above-discussed claimed features as recited, inter alia, in Claim 23. It is further respectfully submitted that there has been no showing of any indication of motivation in the cited documents that would lead one to arrive at the claimed features.

Claim 39 recites, inter alia, for the third lens in order from the object side of the four single lenses, a surface of the object side is an aspherical surface. The Official Action notes that Mukaiya, et al. does not disclose such a surface, and therefore relies upon Yamanishi,

specifically surface R6 of Example 2. However, Applicant respectfully submits that such surface is not aspherical in Yamanishi. Applicant also notes that in Uzawa, surface R6 of Example 2 is aspherical, but that such is a surface of an image side of a second lens. Applicant respectfully submits that neither Mukaiya, et al. nor Yamanishi or Uzawa, even in combination, assuming, arguendo, that the documents could be combined, discloses or suggests at least the above-discussed claimed features as recited, inter alia, in Claim 39. Applicant also respectfully submits that there has been no showing of any indication of motivation in the cited documents that would lead one to arrive at the above-discussed claimed features.

The dependent claims are also submitted to be patentable because they set forth additional aspects of the present invention and are dependent from independent claims discussed above. Therefore, separate and individual consideration of each dependent claim is respectfully requested.

This Amendment After Final Rejection is an earnest attempt to advance prosecution and reduce the number of issues, and is believed to clearly place this application in condition for allowance. Furthermore, Applicant respectfully submits that a full appreciation of these amendments will not require undue time or effort given the Examiner's familiarity with this application. Moreover, this Amendment was not earlier presented because Applicant earnestly believed that the prior Amendment placed the subject application in condition for allowance. Accordingly, entry of this Amendment under 37 C.F.R. § 1.116 is respectfully requested.

Applicant submits that this application is in condition for allowance, and a Notice of Allowance is respectfully requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our address given below.

Respectfully submitted,

Daniel H. Heck
Attorney for Applicant

Registration No. 37,838

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

DSG\lp

DC_MAIN 100080 v 1



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MARKED-UP CLAIM SHEET

12. (Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive refractive power,

a second lens unit of negative refractive power,

a third lens unit of positive refractive power, and

a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four single lenses including three negative lenses and one positive lens, and at least one of said four single lenses is an aspherical lens, and

wherein the zoom lens satisfies the following condition:

$$1.28 < |R24/R25| < 3.20$$

where R24 and R25 are radii of curvature of the fourth and fifth lens surfaces, respectively, when counted from the object side, in said second lens unit.

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13. (Amended) A zoom lens according to claim 12, wherein said second lens unit consists of, in order from the object side to the image side,

a negative first lens having a concave surface of larger curvature facing the image side than that of an opposite surface thereof,

a bi-concave negative second lens,

a positive third lens having a convex surface of larger curvature facing the object side than that of an opposite surface thereof, and

a bi-concave negative fourth lens.

23. (Twice Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving [during] moving to the image side for zooming from the wide-angle end to the telephoto end,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has, in order from the object side to the image side, a positive lens having an aspherical surface and a negative meniscus lens having a convex surface facing the object side, and

wherein said second lens unit has three negative lenses and one positive lens.

30. (Amended) A zoom lens according to Claim 23, wherein said second lens unit comprises, in order from an object side to an image side,

a first negative lens having a concave surface of stronger optical power on the image side than on the object side,

a second negative lens both surfaces of which are concave,

a first positive lens having a convex surface of stronger optical power on the object side than on the image side, and

a third negative lens, both [surface] surfaces of which are concave.

32. (Amended) A zoom lens according to Claim 30, satisfying the following condition:

$$[66] \underline{1.66} < |R24/R25| < 4.00$$

where R24 and R25 are the radii of curvature of the fourth lens surface and the fifth lens surface, respectively, counted from the object side, of said second lens unit.

33. (Amended) A zoom lens according to Claim 30, satisfying the following condition:

$$[00] \underline{1.00} < |R26/R27| < 1.46$$

where R26 and R27 are the radii of curvature of the sixth lens surface and the seventh lens surface, respectively, counted from the object side, of said second lens unit.

34. (Amended) [An optical appliance] A camera comprising:
a zoom lens according to Claim 23; and
an image pickup element, said image pickup element receiving an image formed
by said zoom lens.

36. (Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,
a second lens unit of negative optical power, said second lens unit moving during zooming,
a third lens unit of positive optical power, and
a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has a positive lens, both surfaces of which are aspherical, and

wherein said second lens unit has three negative lenses and one positive lens,
said zoom lens satisfying the following condition:

$$0.86 < |f_3/f_A| < 1.09$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_w and f_t are focal lengths at the wide-angle end and the telephoto end of the entire zoom lens, and f_3 is a focal length of said third lens unit.

37. (Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving during zooming,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has a positive lens, both surfaces of which are aspherical, [and]

wherein said second lens unit has three negative lenses and one positive lens, [and wherein]

wherein said fourth lens unit moves during focusing, and

wherein the following condition is satisfied:

$$0.40 < \beta_{4T} < 0.55$$

wherein β_{4T} is the magnification at the telephoto end of said fourth lens unit with an object at infinity.

38. (Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive optical power,

a second lens unit of negative optical power, said second lens unit moving during zooming,

a third lens unit of positive optical power, and

a fourth lens unit of positive optical power, said fourth lens unit moving during zooming,

wherein said third lens unit has a positive lens, both surfaces of which are aspherical, [and]

wherein said second lens unit has three negative lenses and one positive lens, and

wherein said second lens unit comprises, in order from an object side to an image side,

(a) a first negative lens having a concave surface of stronger optical power on the image side than on the object side,

(b) a second negative lens both surfaces of which are concave,

(c) a first positive lens having a convex surface of stronger optical power on the object side than on the image side, and

(d) a third negative lens, both surface of which are concave, [and]

said zoom lens satisfying the following condition:

$$[66] \underline{1.66} < |R_{24}/R_{25}| < 4.00$$

where R24 and R25 are the radii of curvature of the fourth lens surface and the fifth lens surface, respectively, counted from the object side, of said second lens unit.

39. (Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive refractive power,

a second lens unit of negative refractive power,

a third lens unit of positive refractive power, and

a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four single lenses including three negative lenses and one positive lens, and [,]

wherein for the third lens in order from the object side of said four single lenses, a surface of the object side [of the third lens in order from the object side] is an aspherical surface.

41. (Amended) A zoom lens comprising, in order from an object side to an image side,

a first lens unit of positive refractive power,

a second lens unit of negative refractive power,

a third lens unit of positive refractive power, and

a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four single lenses including three negative lenses and one positive lens, and at least one of said four single lenses is an aspherical lens,

wherein the zoom lens satisfies the following condition:

$$0.25 < |f_2/f_A| < 0.41$$

where

$$f_A = \sqrt{f_w \cdot f_t}$$

wherein f_2 is a focal length of said second lens unit, and f_w and f_t are focal lengths in the wide-angle end and the telephoto end of said zoom lens, respectively.

42. (Amended) [An optical apparatus] A camera comprising:

[an optical element; and]

a zoom lens [, adapted to be connected to said optical element, comprising, in order from an object side to an image side, a first lens unit of positive refractive power, a second lens unit of negative refractive power, a third lens unit of positive refractive power and a fourth lens unit of positive refractive power, zooming from a wide-angle end to a telephoto end being

effected by moving said second lens unit toward the image side, and shifting of an image plane due to zooming being compensated for by moving said fourth lens unit,

wherein said second lens unit consists of four single lenses including three negative lenses and one positive lens, and at least one of said four single lenses is an aspherical lens, and

wherein the zoom lens satisfies the following condition:

$$1.28 < |R24/R25| < 3.20$$

where R24 and R25 are radii of curvature of the fourth and fifth lens surfaces, respectively, when counted from the object side, in said second lens unit] according to Claim 12; and

an image pickup element, said image pickup element receiving an image formed by said zoom lens.